west virginia department of environmental protection

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# ENGINEERING EVALUATION / FACT SHEET

## BACKGROUND INFORMATION

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|---|---|
| Application No.: | R13-2844 |
| Plant ID No.: | 055-00121 |
| Applicant: | West Virginia Recycling, Inc. |
| Facility Name: | Recycle West Virginia |
| Location: | Princeton |
| SIC Code: | 5093 |
| Application Type: | Construction |
| Received Date: | May 24, 2010 |
| Engineer Assigned: | Edward S. Andrews, P.E. |
| Fee Amount: | $1000.00 |
| Date Received: | May 24, 2010 |
| Completeness Date: | June 10, 2010 |
| Due Date: | September 9, 2010 |
| Newspaper: | *Princeton Times* |
| Applicant Ad Date: | June 4, 2010 |
| UTMs: | Easting: 492.4 km Northing: 4,136.9 km Zone: 17 |
| Description: | This permitting request is for the after-the-fact construction of a scrap metal recycling operation. |

## DESCRIPTION OF PROCESS

West Virginia Recycling' Princeton Facility processes scrap metal item into base metals. The Princeton Facility consists of a scrap metal shredding and separation system. All shapes and sizes of metals (including automobiles) and reduces those metals to a sorted and sellable product. The scrap metal shredding unit is capable of shredding whole automobiles and other items.

Once shredded, the metal sorting process begins. Recycle WV use separation process manufactured by Harris. This sort process used several different methods to sort out steel, iron, stainless steel, aluminum, and copper from the scrap material received. Small electric motors are shredder. However, Recycle WV's operation cannot effectively separate the base metal in these electric motors. Instead, Recycle WV sorts these motors using their sorting system and sold to other scrap metal processor in China or India.

Method of sorting the material includes using magnetic fields, eddy currents, cyclone, magnetic induction, induction circuit, and human pickers. Recycle WV's sorting process is adjustable and can be fine tuned to sort only specific metal. In addition, the sorted material may need to be re-shredder and sent back through the sorting process to either increase the metal yield or recover a different metal. This depends on the metal being recovered and potential customer or end user. Once all of the recoverable metals are removed from the material. This material is a waste product or commonly referred as fluff. Depending on if any and what of metal in the fluff, this material may be sold to another scrap metal process that can recover the metal out of this fluff. Otherwise, this fluff is sent to a landfill.

Recycle WV usually ships its recovered metal to its customers in tractor-trailers. Sometimes, its overseas customers request that the metal to be loaded into overseas cargo containers. There are plans to install a rail siding to the facility, which will allow material to be loaded to rail which will reduce the trucking from the facility.

SITE INSPECTION

On July 13, 2010, this writer met with Mr. Tommy Bishop, Operations Manager, from Recycle WV in Princeton, WV. Recycle WV's site was Norfolk Southern former locomotive repair shop located on Virginian Industrial Park Road. Of the former shop, only three buildings are still standing. Recycle WV is using these structures as part of its Princeton facility. The scale house, company's administration offices, and warehouse are located in one of these

building. The automobile inspection area is located in another. While the sorting operation is located inside of the largest of the three buildings. Sorted metal stockpiles and the shredder are located adjacent to this building on the west side.

In 2007, West Virginia Recycling form and began to set up operation at the Princeton facility. Construction of the Harris shredder system began in 2007. On December 20, 2008, the shredder was started-up. In April 2008, Recycle WV began accepting scrap metal items.

The facility's nearest neighbor is Pounding Mill Quarry and Norfolk Southern's Princeton yard, which at least about 1,000 feet due south from the main entrance. It is this writer opinion that the location of this metal processing operation is acceptable.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions estimates provide in the application from the proposed activities at the facility were based on AP-42 factors and a emission factor developed by Institute of Scrap Recycling Industries (ISRI). However, there is no AP-42 factor for metal shredding or handling shredded metal pieces or screening of metal pieces. The applicant used the same emission factors as proposed in the application for RJ Recycling. RJ Recycling application used an emission factor developed from the **Title V Applicatbility Workbook** published by the Institute of Scrap Recycling Industries (ISRI) and AP-42 factors. ISRI factor was developed for dry shredders of scrap metal using hammer mills. However, it is assumed that damp or wet shredding would be better controlled than dry shredders.

In the applicant's estimates, the ISRI shredder factor was used to for ten other sources beside the shredder. The main activity of these other sources is sorting the base metals (ferrous and non-ferrous metal) from fluff (non-metallic) materials. Thus, this writer would have not treated them as having the same potential to emit as a shredder. Thus, this writer believes the use

of ISRI factor for shredding not to be appropriate for the metal sorting sources as listed in this application.

These sorting operations/activities and the associated transfer point have little to no potential to emit of particulate matter. Recycle WV is in the business to separate material based on the base metal of the material. The purpose operation only to reduce the size of the item so that sorting operation can separate the material by specific type of metal. Therefore, this writer believes that the use the drop point equation for AP-42 to account for these emissions, which was created to account for particulate matter from the handling of aggregate and mineral products, to be inappropriate for this case.

The annual emissions in the application were based on processing 400,000 tons of material annually. Recycle WV will at times process the same two or more times in trying to recover all of certain type of metal out of specific pile of material. Thus, this annual weight processing could actual be 800,000 to 1,200,000 tons per year. Because tracking this limit could be difficult for any given frequency, this writer used 8,760 hours for an operating year, which equates to a potential to emit of PM and $PM_{10}$ of 1.8 tons per year. This rate is based on processing 160 tons per hour and ISRI factor of 0.00257 lb of PM per ton of material process or a $PM/PM_{10}$ rate of 0.41 pounds per hour.

Haulroads at the facility are mainly unpaved after the scale house. There is a small strip of Virginian Industrial Park Road, which is owned by the State of West Virginia that is unpaved as well. According to Recycling WV, this unpaved section of Virginian Industrial Park Road will be paved by the State in the near future. The haulroads owned by the applicant have the potential to emit 26.5 tons PM per year with controls measures applied. This potential includes truck and end loader traffic. Recycle WV is planning to construct a spur line that connects to Norfolk Southern main line, which is adjacent to the facility. This spur line would allow Recycle WV to ship their sorted metal by rail in addition to trucks. This rail traffic would reduce the facility's actual haul road emission without generating any new emissions. The loading methods into rail cars would be same as loading into trucks.

There are other sources of air pollutants at the facility which are portable heaters and cutting torches. The sources are deem insignificant by this writer. Overall, this facility has the potential to emit 28.3 TPY of PM. Of this 28.3 tons of PM, 9.6 tons is classified as $PM_{10.}$

REGULATORY APPLICABILITY

45CSR7 To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

The total allowable particulate emission rate listed in 45CSR7, section 4.1, for Type 'a' source operations (physical change) for the shredder (S) is 47 lb/hr. Emission rate for particulate matter for the Scrap Metal Shredder (EP02) is 0.0.41 lb/hr, which indicates they will meet the requirements of 45CSR7, section 4.1. The particulate matter generated from the facility is subject to the particulate emission standards under 45CSR7, Table 45-7A, and the 20% opacity limit set forth in section 3.1. Recycle WV is subject to the opacity requirements set forth in 45CSR7. This particular shredder is equipped with a water injection system that automatically injects water into the shredding chamber. Harris, the shredder system manufacturer, developed this water injecting system to control dust and "blue smoke" emission from its shredders. Because of the heat generated from the shredding operation, this water injection will created a steam plum. Thus, the Method 22 observations or any version of Method 22 observations would not be appropriate for this shredder.

Method 9 observations may be acceptable means for demonstrating compliance with the visible emissions for Rule 7. However, the scrap material received at the facility is constantly changing. Currently, Recycling WV does not accept the following materials:

- Radioactive materials
- Hazardous materials (oil antifreeze and paints)
- Non-metallic (tires, wood, asbestos, fiberglass insulation, roofing, dirt, solid waste)

- Corrosives (non-lead batteries) Lead batteries is accepted but are not shredder.
- Sealed Canisters (pressured vessels)
- Flammable materials
- Other Hazardous materials (Pesticides, air bags, oil filters, lead, mercury, computers, microwaves, televisions, fluorescent lights, electronics)
- Refrigerants
- PCBs (Capacitors, transformers, ballast)
- Explosives (Fire arms, ammunition, shells)

Recycle WV inspects automobiles and other items prior to being shredder. Automobiles are shredder after the batteries, fuel tanks, tires, and mercury switches are removed. In addition, Recycle WV's operators screens and sorts when the materials upon receiving it before it is shredder. Besides looking for these prohibited materials, the pre sorting the material before shredder allows Recycle WV to optimize the sorting operation to maximum the base metal yield from the scrap.

By restricting and sorting the incoming scrap, Recycle WV is reducing its potential to emit by not shredding certain materials that could cause and contribute to the release of air pollutants or items that would cause up set (explosion) that would emit particulate matter in be discharged into the air.

This process of screening the material when received and proposed water injection system should be sufficient to ensure compliance with the process weight limit and visible emission standard as required under this rule.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation

According to the application, Recycle WV proposed construction of a scrap metal shredder and separation system falls under section 2.5 for construction permits and will be subject to all applicable requirements concerning construction permits in 45CSR13. 45CSR13 applies to this source because they exceed 10 tons/year of particulate matter emissions.

45CSR22 Air Quality Management Fee Program

Recycle WV met the fee schedule set forth in 45CSR22, which consists of a $1,000.00 permit application fee. They are also required to keep their Certificate to Operate (CTO) status up to date.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

No non-criteria regulated pollutants will be emitted from this facility. Therefore, no toxicity analysis was performed.

## AIR QUALITY IMPACTS ANALYSIS

This writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition as a major modification as defined in 45CSR14.

## MONITORING OF OPERATIONS

Typically, most source operations would be required to track their processing rate or throughput. However, this type of recycling operation may need to reprocess the same material two or more times to maximize the yield of specific metal from a certain pile of material. Also, certain thick scrap (steel plate with a thickness greater ½") cannot be processed effectively by

Recycle WV, which is usually sold to other processes. Thus, setting an annual throughput limit for this particular source would falsely restrict Recycle WV's operations.

Taking the shredder potential to emit into consideration, this permit should focus on established work practices and setting a maximum electric motor capacity for the shredder. Currently, Recycle WV has the shredder been driven with a 4,500 hp motor. Harris recommends that maximum size motor to drive the shredder is a 6,000 hp to accommodate a shredder rate of 160 ton per hour. Because the density of the scrap material being shredder varies, monitoring the hourly process weight would be very subjective. Restricting the drive motor not to exceed a specific horsepower that correlates to a specific shredding rate could easily be verified by checking the motor nameplate.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed flare will meet all the requirements of the application rules and regulations when operated in accordance to the permit application. Therefore, this writer recommends granting West Virginia Recycling, Inc. a Rule 13 construction/modification permit for their Recycling WV facility located in Princeton, WV.

Edward S. Andrews, P.E.
Engineer

Date: July 30, 2010